

REMARKS

The Official Action mailed June 30, 2010, has been received and its contents carefully noted. This response is filed within three months of the mailing date of the Official Action and therefore is believed to be timely without extension of time. Also, filed concurrently herewith is a *Request for Continued Examination*. Accordingly, the Applicant respectfully submits that this response is being timely filed.

The Applicant notes with appreciation the consideration of the Information Disclosure Statements filed on July 27, 2006; September 21, 2006; November 9, 2009; and April 14, 2010.

A further Information Disclosure Statement is submitted herewith and consideration of this Information Disclosure Statement is respectfully requested.

Claims 1-9, 13-21 and 25-29 were pending in the present application prior to the above amendment. New claims 30-36 have been added to recite additional protection to which the Applicant is entitled. Accordingly, claims 1-9, 13-21 and 25-36 are now pending in the present application, of which claims 1-4, 8, 9, 13-16, 20 and 21 are independent. For the reasons set forth in detail below, all claims are believed to be in condition for allowance. Favorable reconsideration is requested.

Paragraph 9 of the Official Action rejects claims 1-3, 5, 6, 8, 9, 13-15, 17, 18, 20, 21 and 25-29 as obvious based on the combination of U.S. Publication No. 2003/0218418 to Sato, U.S. Publication No. 2002/0086180 to Seo and U.S. Patent No. 6,084,176 to Shiratsuchi. Paragraph 10 of the Official Action rejects claims 1, 4, 7-9, 13, 16, 19-21, 25, 26 and 28 as obvious based on the combination of Sato, Seo and U.S. Patent No. 5,487,953 to Shiota. The Applicant respectfully traverses the rejection because the Official Action has not made a *prima facie* case of obviousness.

As stated in MPEP §§ 2142-2144.04, to establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some reason, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second,

there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. Obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some reason to do so found either explicitly or implicitly in the references themselves or in the knowledge generally available to one of ordinary skill in the art. "The test for an implicit showing is what the combined teachings, knowledge of one of ordinary skill in the art, and the nature of the problem to be solved as a whole would have suggested to those of ordinary skill in the art." In re Kotzab, 217 F.3d 1365, 1370, 55 USPQ2d 1313, 1317 (Fed. Cir. 2000). See also In re Fine, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988); In re Jones, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992).

There is no proper or sufficient reason, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify Sato and Seo or to combine reference teachings to achieve the claimed invention. MPEP § 2142 states that the examiner bears the initial burden of factually supporting any *prima facie* conclusion of obviousness. It is respectfully submitted that the Official Action has failed to carry this burden. While the Official Action relies on various teachings of the cited prior art to disclose aspects of the claimed invention and asserts that these aspects could be modified in the manner asserted in the Official Action, it is submitted that the Official Action does not adequately set forth why one of skill in the art would combine the references to achieve the features of the present invention.

The test for obviousness is not whether the references "could have been" combined or modified as asserted in the Official Action, but rather whether the references should have been. As noted in MPEP § 2143.01, "The mere fact that references can be combined or modified does not render the resultant combination obvious unless the results would have been predictable to one of ordinary skill in the art" (emphasis in original). KSR International Co. v. Teleflex Inc., 550 U.S. \_\_\_, \_\_\_, 82

USPQ2d 1385, 1396 (2007). Thus, it is respectfully submitted that the standard set forth in the Official Action is improper to support a finding of *prima facie* obviousness.

The Official Action concedes that Sato does not teach "a carbazole compound with a transition metal oxide in the hole transporting layer" (page 4, Paper No. 20100622). The Official Action relies on Seo to allegedly teach "combining the hole injection and transport layers into a single mixed layer" so that "an energy barrier can be reduced lowering drive voltage and increasing service life of the device" (pages 4-5, *Id.*). The Official Action asserts that "[i]t would have been obvious to one of ordinary skill in the art at the time of the invention [to] combine the hole transport and injection layers, as taught by Seo et al., in the device of Sato et al." and that "[o]ne of ordinary skill in the art would reasonably expect that *adding* oxides of ruthenium or molybdenum to the hole transport layer would not destroy the function of the layer given that Sato et al. clearly discloses the metal oxides to [possess] properties desirable for the hole transport layer" (page 5, *Id.*; emphasis in original). The Applicant respectfully disagrees and traverses the above assertions in the Official Action.

Although Seo discloses a hole injecting material that is "small in ionization potential" and combining a hole injection layer and a hole transport layer (paragraphs [0033] and [0182]), Seo does not teach or suggest using a material of an oxide of a transition metal as a hole injecting layer. Although Seo discloses super-thin films of aluminum oxide (alumina) as metal oxide, the property of the aluminum oxide is not equal to the oxide of the transition metal, such as ruthenium oxide and molybdenum oxide, because the aluminum oxide is a highly insulating material ("when a highly insulating material such as aluminum oxide is used as the hole injecting material," paragraph [0141] of Seo). As such, the Official Action has not set forth sufficient reasons why one of ordinary skill in the art at the time of the present invention would have incorporated Seo into Sato, because Sato teaches that material used for the hole transporting layer needs a small ionization potential, high hole mobility and excellent stability.

Therefore, the Applicant respectfully submits that the Official Action has not provided a proper or sufficient reason, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify Sato and Seo or to combine reference teachings to achieve the claimed invention.

Please incorporate the arguments above with respect to the deficiencies in Sato and Seo. Shiratsuchi does not cure the deficiencies in Sato and Seo. The Official Action asserts that carbazole compounds and hole transporting compounds of Sato "are equivalent and interchangeable" (pages 5-6, Id., citing column 13, line 12, to column 14, line 5, of Shiratsuchi). The Applicant respectfully disagrees and traverses the assertions in the Official Action.

In comparing the present invention with JP 2003-272860 (cited in the Information Disclosure Statement filed July 27, 2006), the Applicant respectfully submits that one should readily understand the difference between the claimed invention and the combination of Sato, Seo and Shiratsuchi. JP '860 is in the family of U.S. Publication No. 2003/0189401 to Kido (also cited in the Information Disclosure Statement filed July 27, 2006). In JP '860, a high absorption peak is observed not only in the infrared region but also in the visible light region (around 500 nm) (see paragraph [0009] of Kido). Kido uses  $\alpha$ -NPD (arylamine compound) as a hole transporting material, and an oxide of transition metal ( $V_2O_5$  and  $Re_2O_7$ ). Please see Figures 5 and 7 of Kido (reproduced and annotated below) and paragraphs [0146] and [0147].

Fig. 5

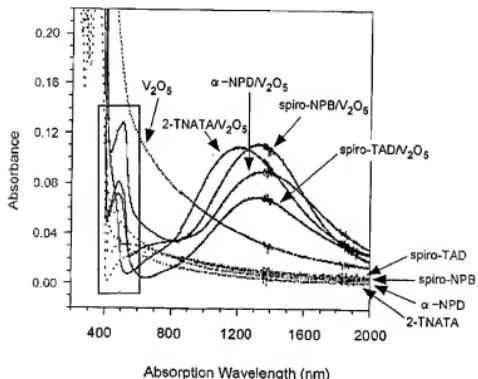
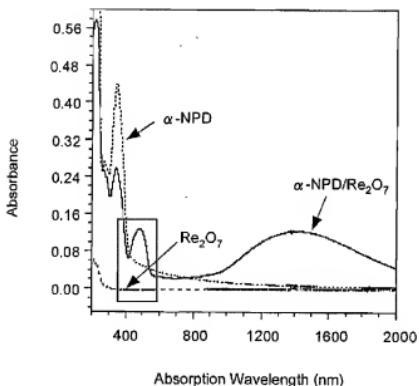


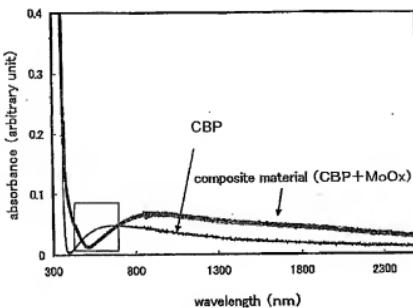
Fig. 7



On the other hand, in the present invention, the absorption spectrum of the composite material formed of CBP (aryl carbazole) and molybdenum oxide does not

have large absorption, in not only the visible light region but also the infrared region, and it is a material having excellent transparency. Please see Figure 12 of the present invention (reproduced and annotated below).

FIG.12



Therefore, the Applicant respectfully submits that it is difficult for one of ordinary skill in the art to anticipate that the composite material formed of aryl carbazole and oxide of transition metal does not have the above effect as compared to a case of the composite material formed of amine compound and the oxide of transition metal. As such, the carbazole compounds and hole transporting compounds of Sato are not, in fact, recognized to be equivalent or interchangeable. If these compounds were equivalent and interchangeable, then the Applicant thinks that one of ordinary skill in the art would anticipate that the composite material formed of amine compound and the oxide of the transition metal would have a high absorption peak in the infrared region and the visible light region, which is not, in fact, the actual result as demonstrated in the present application.

As such, Sato, Seo and Shiratsuchi, either alone or in combination, do not teach or suggest sufficient reasons why one of ordinary skill in the art at the time of the present invention would have necessarily combined Sato, Seo and Shiratsuchi to

achieve the present invention. Since there is insufficient reason to combine Sato, Seo and Shiratsuchi, a *prima facie* case of obviousness cannot be maintained.

Shirota does not cure the deficiencies in Sato and Seo. The Official Action relies on Shirota to allegedly teach "carbazole compounds of instant general formula (4) as suitable compounds for the hole transport layer ... used in [an] organic electroluminescent device" (page 9, *Id.*). However, Sato, Seo and Shirota, either alone or in combination, do not teach or suggest why one of ordinary skill in the art at the time of the present invention would have necessarily combined Sato and Seo to achieve the present invention. Since there is insufficient reason to combine Sato, Seo and Shirota, a *prima facie* case of obviousness cannot be maintained.

In the present application, it is respectfully submitted that the prior art of record, either alone or in combination, does not expressly or impliedly suggest the claimed invention and the Official Action has not presented a convincing line of reasoning as to why the artisan would have found the claimed invention to have been obvious in light of the teachings of the references.

For the reasons stated above, the Official Action has not formed a proper *prima facie* case of obviousness. Accordingly, reconsideration and withdrawal of the rejections under 35 U.S.C. § 103(a) are in order and respectfully requested.

Paragraph 12 of the Official Action provisionally rejects claims 1-3, 5, 6, 8, 9, 13-15, 17, 18, 20, 21 and 25-29 under the doctrine of obviousness-type double patenting over the combination of claims 30-42 and 50 of copending Application No. 10/571,891 to Ikeda and Shiratsuchi. Paragraph 15 of the Official Action provisionally rejects claims 1, 4, 7-9, 13, 16, 19-21 and 25-29 under the doctrine of obviousness-type double patenting over the combination of claims 30-42 and 50 of the Ikeda '891 application and Shirota.

The Applicant respectfully requests that the double patenting rejections be held in abeyance until an indication of allowable subject matter is made in the present

application. At such time, the Applicant will respond to any remaining double patenting rejections.

Paragraph 13 of the Official Action asserts that “[c]laims 1-3, 5, 6, 8, 9, 13-15, 17, 18, 20, 21, and 25-29 are directed to an invention not patentably distinct from claims 30-42 and 50 of [the Ikeda '891 application]” (page 13, *Id.*). Paragraph 14 of the Official Action provisionally rejects claims 1-3, 5, 6, 8, 9, 13-15, 17, 18, 20, 21 and 25-29 as being obvious over a theoretical but as yet unpublished patent resulting from the Ikeda '891 application. Paragraph 16 of the Official Action asserts that “[c]laims 1, 4, 7-9, 13, 16, 19-21, and 25-29 are directed to an invention not patentably distinct from claims 30-42 and 50 of [the Ikeda '891 application]” (page 16, *Id.*). Paragraph 17 of the Official Action provisionally rejects claims 1, 4, 7-9, 13, 16, 19-21 and 25-29 as being obvious over a theoretical but as yet unpublished patent resulting from the Ikeda '891 application.

The Applicant respectfully requests that the above-referenced assertions and provisional obviousness rejections be held in abeyance until an indication of allowable subject matter is made in the present application. At such time, the Applicant will respond to any remaining assertions and obviousness rejections.

New dependent claims 30-36 have been added to recite additional protection to which the Applicant is entitled. The features of claims 30-36 are supported in the present specification, for example, by paragraph [0016], as filed. For the reasons stated above and already of record, the Applicant respectfully submits that new claims 30-36 are in condition for allowance.

Should the Examiner believe that anything further would be desirable to place this application in better condition for allowance, the Examiner is invited to contact the undersigned at the telephone number listed below.

The Commissioner is hereby authorized to charge fees under 37 C.F.R. §§ 1.16, 1.17, 1.20(a), 1.20(b), 1.20(c), and 1.20(d) (except the Issue Fee) which may be required now or hereafter, or credit any overpayment to Deposit Account No. 50-2280.

Respectfully submitted,

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